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1603
f 127

1803. f. 127.

EXERCISES

IN

MENTAL

AND

SLATE ARITHMETIC,

FOR BEGINNERS,

BY J. COPLAND, KILWINNING,
Author of "Arithmetic of Fractions and Proportion for Pupil Teachers," &c.

Edinburgh:
WM. P. NIMMO, 2 ST. DAVID STREET.
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Price Fourpence.

MULTIPLICATION TABLE.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

BIBLIOTHECA · BODLEIANA

1. MONEY.

4 farthings = 1 penny.
12 pence = 1 shilling.
20 shillings = 1 pound.

2. TROY WEIGHT.

24 grains = 1 pennyw't (dwt.)
20 pennyw'ts = 1 ounce (oz.)
12 ounces = 1 pound (℔.)

3. AVOIRDUPOIS.

16 drams = 1 ounce (oz.)
16 ounces = 1 pound (℔.)
28 pounds = 1 quarter (qr.)
4 quarters or 112 lbs. } = 1 hundredw't (cwt.)
20 cwt. = 1 ton.

4. MEASURE OF CAPACITY.

4 gills = 1 pint.
2 pints = 1 quart.
4 quarts = 1 gallon.
2 gallons = 1 peck.
4 pecks = 1 bushel.
8 bushels = 1 quarter.

5. CLOTH MEASURE.

2¼ inches = 1 nail.
4 nails = 1 quarter.
4 quarters = 1 yard.

6. LONG MEASURE.

12 inches = 1 foot.
3 feet = 1 yard.
5½ yards = 1 pole.
40 poles = 1 furlong.
8 furlongs or 1760 yds. } = 1 mile.

7. SQUARE MEASURE.

114 sq. inches = 1 sq. foot.
9 sq. feet = 1 sq. yard.
30¼ sq. yards = 1 sq. pole.
40 poles = 1 rood.
4 roods = 1 acre.

8. CUBIC OR SOLID MEASURE.

1728 cub. in. = 1 cub. foot.
27 cub. feet = 1 cub. yard.

9. MEASURE OF TIME.

60 seconds = 1 minute.
60 min. = 1 hour.
24 hours = 1 day.
365 days = 1 common year.
366 days = 1 leap year.

The year is divided into 12 *Calendar months,* all of which have 31 days except *February,* and the 4 mentioned in the following lines:—

Thirty days have *September,*
April, June, and *November.*
In common years Feb. has 28, in leap year 29.

TABLE I.

1	*one.*
10	*one* ten.
100	*one* hundred.
1,000	*one* thousand.
10,000	*one* ten thous.
100,000	*one* hund. thou.
1,000,000	*one* million.
10,000,000	*one* ten mill.
100,000,000	*one* hund. mill.

Orders. 9th 8th 7th 6th 5th 4th 3d 2d 1st

TABLE II.

Units	1
Tens	12
Hundreds	123
Thousands	1,234
Tens of thous.	12,345
Hund. of thous.	123,456
Millions	1,234,567
Tens of mill.	12,345,678
Hund. of mill.	123,456,789

Periods. III Mill. II Thous. I Units.

What is 5 in the first order? 4 in the second? 3 in the third?

In writing one hundred, what orders are filled up with noughts?

Write the following and then read them:—4 units of the third order and 3 of the first; 3 units of the fourth and 2 of the second; 5 of the fourth and three of the first; 9 of the seventh and 4 of the third.

What is 3 in the first place? in the second place? in the third?

Give the local value of each figure in the following numbers:—4414, 7605, 5050, 6004. In this last number, into what order would you advance the 4 to increase its value a hundred fold?

How many figures are required to write any number between ten and a hundred?

Write the smallest number consisting of three figures.

How many figures are required to write each of the following:—Two hundred and one; 3 hundreds, 4 tens, 7 ones; 4 millions?

Refer to Table II., and read the figures of the first column (one unit, two units, &c.) Read the 2d and 1st together as units (one unit, twelve units, &c.) Read the 2d as units (ten units, twenty units, &c.) Read the 2d as tens (one ten, two tens, &c.) Read the 3d and 2d together (twelve tens, twenty-three tens, &c.) And so on.

Read from the book the last 10 Questions in Addition.

Read the following Nos.—(1) as hundreds, tens, and ones; (2) as tens and ones:—326, 475, 504, 700, 830, 907.

Write as many Nos. as you can with the figures 4, 0, 5, 6.

Note.—The Multiplication Table to be committed to memory before commencing Addition.

Add 2 and 2	3 and 3	4 and 4	5 and 5	6 and 6
" 2 and 3	3 and 4	4 and 5	5 and 6	6 and 7
" 10 and 2	10 and 3	10 and 4	10 and 5	10 and 6
" 10 and 4	20 and 4	30 and 4	40 and 4	50 and 4
" 2 and 3	12 and 3	22 and 3	32 and 3	42 and 3
" 5 and 8	15 and 4	25 and 4	35 and 4	45 and 4
" 7 and 2	17 and 8	27 and 8	37 and 8	47 and 8
" 9 and 9	9 and 3	9 and 4	9 and 5	9 and 6
" 8 and 9	17 and 9	26 and 9	35 and 9	44 and 9
" 6 and 4	14 and 9	25 and 9	36 and 9	48 and 9

Count by twos (2, 4, 6, &c.); also by threes, fours, fives, &c.

Count by twos from 1 (3, 5, 7, &c.); also by the higher numbers.

Count by fours, beginning at 3; also by the higher numbers.

Count by twos, and interpolate 1 every third addition, (2, 4, 6 (now add 1), 7, 9, &c.)

Add 6 to each of the following numbers, naming the sums *without hesitation*:—

6, 8, 3, 10, 5, 2, 7, 4, 1, 9, 11, 12 (on black-board.)

Add 1, 2, and 3; 2, 3, 4; 3, 4, 5; 4, 5, 6; 5, 6, 7.

Add 1, 2, 3, 4, 5; 2, 3, 4, 5, 6; 3, 4, 5, 6, 7.

Add 1, 2, 3, 4; 3, 4, 5, 6; 4, 5, 6, 7, 8, 9.

Find the sum of all the Nos. from 1 to 9 inclusive; from 1 to 15.

Add 4 and 4; 14 and 4; 24 and 4; 5 and 5; 15 and 5; 25 and 5; 6 and 6; 16 and 6; 26 and 6; 7 and 7; 17 and 7; 27 and 7; 8 and 8; 18 and 8; 28 and 8; 9 and 9; &c.

Add 20 and 20; 24 and 24; 30 and 30; 35 and 35; 40 and 40.

How many sixes make up 18? How many fives 20?

What two numbers added together make up 10, 9, 11, 7, 8.

Add together a gross, a score, and a dozen.

To 8 add 4 six times. To 9 add 8 four times. To 4 add 7 three times.

How many corners have 6 slates? How many months in 4 years?

How many legs have 5 horses and 2 hens? How many days in 3 weeks?

1.	2.	3.	4.	5.	6.
42368	63854	24328	57291	44284	27576
28444	63236	46648	14649	66842	64325
65432	46963	75374	76684	38976	68642
44322	34753	54154	58475	16766	86533

7.	8.	9.	10.	11.	12.
83649	26523	22466	56432	64566	38642
24226	92582	58683	25266	84286	24876
42484	94268	66247	81688	42683	88478
76757	57961	76926	17843	79634	68253
54533	34749	53704	75625	57353	36035

13.	14.	15.	16.	17.	18.
42358	38654	56538	44823	24327	46436
28764	82366	28346	42482	62788	68274
62729	39788	64644	86239	86742	24678
69565	21243	64853	83622	98576	87853
37342	37625	37637	71637	76354	75635

19.	20.	21.	22.	23.	24.
64466	46272	42828	24243	28287	74861
38281	28656	78264	63879	72644	32442
38649	64858	76867	87479	76826	86263
54677	67953	46934	95756	56463	43674
24353	74735	43753	73524	34247	31365

25.	26.	27.	28.	29.	30.
84826	32586	43843	23884	54884	48742
82468	56446	34469	74825	23428	43366
76284	28278	77283	34563	95484	35833
38647	84976	67647	87468	95847	78442
64872	67953	61876	96353	42643	21792
21545	14723	17544	74527	45374	58539

For the Answers, see the corresponding numbers in Multiplication.

31.	32.	33.	34.	35.	36.
75837	59887	86486	56825	84377	78476
97695	62764	47754	88789	49465	67899
99976	79994	59899	48979	78499	97893
75579	75559	65748	57647	49756	35574

37.	38.	39.	40.	41.	42.
66587	98788	72484	38288	96539	98459
88947	83728	28249	58644	83769	84668
86782	77845	13686	61678	18658	79234
26789	74472	94689	43598	46844	76649
53459	47573	37754	74258	53147	47345

43.	44.	45.	46.	47.	48.
56746	67265	75889	69698	12345	46765
88343	85887	32348	36483	23456	98946
69454	35746	68478	65764	34567	45677
88735	89765	41969	47667	45678	56788
49569	85764	76541	75847	34459	34569

49.	50.	51.	52.	53.	54.
94634	88447	46574	83446	78659	43584
87886	64769	58999	54634	39668	46947
29697	45837	64878	67478	99597	72789
69678	76746	89895	27367	18486	57789
96359	88385	82475	95637	69845	31459

55.	56.	57.	58.	59.	60.
79658	54986	64847	53958	52730	76822
52893	47432	82387	86373	88384	73979
58487	67357	46568	95814	79843	64963
54767	45788	28478	68457	66496	88248
67976	87464	68379	24346	24664	42754
65467	65438	37569	85918	58579	75817

61.	62.	63.	64.	65.
13123	431324	454042	642431	3244560
13549	354854	530563	1266464	428244
17246	124554	142863	228647	3283844
54604	249715	134449	3458566	392736
53844	103364	546838	454521	8252766
19653	337357	222106	6222975	377880
23679	645560	639477	432110	4852655
42985	576544	161749	5343989	306084

66.	67.	68.	69.	70.
87600	30190	808	17007	10000
50010	7046	7200	42190	9875
5760	304	900	30900	684
308	5000	2049	6700	7830
1015	3060	560	909	1409
34011	32000	5800	3019	370
7601	304	34000	60100	5090
10101	10004	70000	31010	35101

71.	72.	73.	74.	75.
Pounds.	Miles.	Years.	Crowns.	Acres.
97406	30040	23654	73409	437
3754	73490	4004	6873	1580
40063	6987	1860	900	68087
53007	43200	19764	46	72846
8496	98742	30996	340	80010
74321	3000	87646	7800	3069
12345	24810	17341	52098	30400
80103	68756	9999	73840	187534

The Questions on this page are specially designed to form Exercises in NUMERATION.

2 from 4	3 from 6	4 from 8	5 from 10	6 from 12
2 from 5	3 from 7	4 from 9	5 from 11	6 from 13
2 from 6	3 from 9	4 from 12	5 from 15	6 from 18
2 from 10	3 from 10	4 from 10	6 from 10	7 from 10
10 from 12	10 from 17	10 from 19	10 from 20	10 from 24
9 from 12	9 from 17	9 from 19	9 from 20	9 from 24

Subtract by twos from 20 (20, 18, 16, &c.); by threes from 30.

Subtract by threes from 31; by fours from 39; by fives from 51.

Subtract from 41 by fours, by fives, by sixes, &c.

How many are 6, 2, and 3, less by 4; 5 + 4 + 8 — 7; 20 + 30 + 40 — 10?

Take 4 three times from 14; 8 three times from 30; twice 4 from twice 9.

Add together the diff. of 12 and 20, 12 and 30, and 12 and 40.

Name two numbers to equal 9, 10, 11, 7, 8, 12, 16, 13.

How many must be added to 50 to make 70?

Take 3 (also 4, 5, 6) from each of the following:—9, 11, 16, 13, 18, 10, 8, 22, 19, 7, 23, 18, 14, 7, 15, 20.

In the following lines take each number in the lower from each in the upper:—
20, 26, 23, 30, 32, 36, 40, 48, 50 } black-board.
10, 9, 11, 12, 13, 14, 15, 18, 19 }

Find the diff. between 100, (also 50), and each of the following Nos.:—40, 50, 90, 70, 20, 60, 10, 19, 32, 49, 61, 78, 99.

10 rats have how many more legs than ears?

12 cats have how many more legs than 10 sparrows?

I have 50 sheep; how many less than four score?

Take 3 half dozen eggs from 29.

What is left of 18 pence after paying 4d. and 7d. for tea and sugar?

I lent £20, and have received 5, 6, and 7 pounds; how much still due?

I have 7 nuts in one hand, 4 in the other, and 10 in my pocket; if I give away 9, what will remain?

John has 41 apples, he gave 7 to James, 8 to Tom, and 6 to Mary; how many left?

I had 2 score and 10 sheep; the wolves killed 15, the dogs 20; how many have I now?

John had 14 marbles; he won 5, and afterwards lost 3, and gave 7 away; how many had he then?

1. 47246 34123	2. 594618 163294	3. 805724 351682	4. 7184371 6541940	5. 3427492 182932
6. 57081 43532	7. 638276 283422	8. 702080 171517	9. 8425782 7159318	10. 9146781 8718537
11. 31429 14183	12. 413800 289246	13. 421080 278217	14. 3142863 2914216	15. 4120867 847023
16. 72830 18226	17. 840923 591208	18. 512745 378296	19. 5283197 1824631	20. 3241863 2849127
21. 81731 37887	22. 231502 128138	23. 782467 235629	24. 2138463 1683942	25. 9124000 871234
26. 30082 10429	27. 721483 384126	28. 510010 287904	29. 8716801 2493826	30. 4218081 3840201
31. 42805 19126	32. 972400 326840	33. 827046 187569	34. 5000000 4567890	35. 5271328 418673
36. 134567 91582	37. 700000 123456	38. 410327 245678	39. 8213463 2869474	40. 7206083 5899999

For Answers, see page 8, Ex. 61-65.

In the following table subtract **A** from **B**, till the remainder is less than **A**:—

	B.	A.	Remainder.	Times.
1.	12364	3676	1336	3
2.	13408	4152	1052	3
3.	36825	8324	3529	4
4.	30247	7252	1239	4
5.	41532	9876	2028	4
6.	47340	8247	6105	5
7.	54032	9874	4662	5
8.	130246	48763	32720	2
9.	287463	65732	24534	4
10.	403160	87645	52580	4
11.	316745	54763	42930	5
12.	380702	59649	22808	6
13.	274176	39468	37368	6
14.	490000	60483	6136	8
15.	5885940	980969	126	6
16.	2393863	398276	4207	6
17.	4940035	987908	495	5
18.	3959680	790936	5000	5
19.	2409093	479909	9548	5
20.	5165180	860764	596	6
21.	2710573	536824	26453	5
22.	17625715	8325143	975429	2
23.	23030031	7593945	248196	3
24.	17075660	3413132	10000	5
25.	23780650	3956847	39568	6
26.	25370440	6308652	135832	4
27.	11111111	1234579	—	9
28.	123456790	1234579	—	10

1. What is the difference between six thousand and six, and sixty thousand?
2. What is the difference between one million and one thousand?
3. From 90 thousand and 90 take 12 thousand 12 hundred and twice 12.
4. The greater of two numbers is 4004, and their diff. 96; what is their sum?
5. When will a person born in 1819 be three score and ten?
6. From what number must I subtract 1860 to leave 4004?
7. After taking 1728 from a certain number, 6272 remained; what was the number?
8. Which is the nearer to 334, 486 or 178?
9. After adding 85 five times to a certain number, the result was 1425; what was the number?
10. After taking 85 five times from a certain number, 25 was left; what was the number?
11. How much does 14 thousand and four want of 21 thousand?
12. There are four numbers, the first of which is 287, the second 596, the third 841, and the fourth as much as the other three; what is the sum of the four numbers?
13. How many days has a boy lived who is six years old?
14. How long is it since the conquest of England by the Normans?
15. How much older was Methuselah than Adam?
16. Give the united ages of the Antediluvian Patriarchs?
17. How many more chapters are there in the Old Testament than in the New?
18. From the signing of Magna Charta in 1215 and the Revolution of 1688; how long?
19. Bannockburn fought in 1314, Flodden 1513, Culloden 1746, and Waterloo 1815; how long is it since each of these events?
20. Homer was born 2593 years ago; how long before the Christian era was it?
21. Burns died in 1796, aged 37; when was he born?

22. The mariner's compass was invented in 1302, gunpowder in 1330, and printing in 1441; how many years since each of these events?

23. A man going a journey of 120 miles walked the first day 20 miles, the second 25, the third 30, and the fourth 35; how much farther has he to go?

24. A farmer sold a horse for £50, a cow for £10, and a score of sheep for £35, and paid his rent of £90; how much had he left?

25. John had 100 apples, he gave 16 to his brother, and sold 4 dozen; how many had he left?

26. John had 17 apples, and James 28; James gave John 19 of his; how many had each of them then?

27. How many days are there in the first three months of the year?

28. How many days old is the year on the 15th of March?

29. How many days from 1st Feb. to 15th May inclusive?

30. Last year began on Saturday, on what day of the week did St. Valentine's day (14th Feb.) fall?

31. If Candlemas (2d Feb.) fall on Thursday, on what day of the week did the year begin?

32. The Queen was 22 when the Prince of Wales was born; how old was the Prince when the Queen was 40?—and how old will she be when he is 48?

33. A man leaves Edinburgh and travels west, his wife sets out from Glasgow to meet him; how far are they apart when the former has travelled 19 miles and the latter 17?—the distance between Edinburgh and Glasgow being 46 miles?

34. How far are they apart supposing the wife to have travelled west instead of east?

35. Take 1656 from the sum of 4004 and 1860.

36. Value (1860 — 999) + (475 + 582) — 1900 + 32.

How many legs have 6 horses? How many wheels have 8 carriages?

How many corners have 12 slates? How many fingers have 4 boys?

How many inches in 4 feet? How many shillings in 4 pounds?

4 loaves at 5d. each? 3 books at 9d.?

3 shillings a day; how much a week,—a month?

4 times 2 and 1; 5 times 2 and 1; 6 times 2 and 1?

4 times 3 and 2; 5 times 3 and 2; 6 times 3 and 2?

$4 \times 4 + 3$; $5 \times 4 + 3$; $6 \times 4 + 3$?

$4 \times 5 + 4$; $6 \times 7 + 5$; $8 \times 9 + 7$?

3 times 9 are how many more than 4 times 6?

What is the difference of 4 times 9 and 4 times 11?

Give the squares of the numbers from 1 to 12; also their cubes.

What is the difference of the square of 6 and the square of 7?

Repeat all the prime numbers, (also the composite), between 1 and 30.

What are the factors of 18, 24, 25, 45, 15, 14?

Multiply 10, 20, 30, 40, 50, 15, 25, 35, 45; each by 2, 3, 4, 5, 6, 10, 13, 14, 15, 16, 17, 18, 19.

In the following lines multiply each number in the lower by 2, and to each product add the corresponding figure in the upper line:—

$$\left.\begin{array}{l} 3,\ 4,\ 9,\ 8,\ 7,\ 6,\ 8,\ 5,\ 4,\ 3,\ 1 \\ 5,\ 3,\ 2,\ 11,\ 3,\ 5,\ 4,\ 10,\ 9,\ 7,\ 6 \end{array}\right\}\text{black-board.}$$

20 boys have 5 apples each; how many in all?

If one pound of sugar cost 6d., what will be the cost (in pence) of 4, 5, 6, 7, 8, 9, 10, 11, 12 lbs.?

How many pence in 5, 6, 7, 8, 9 shillings?

How many oranges in 12 baskets, containing 80 each?

Multiply 6 by 3 and by 4; 8 by 4 and by 5; 2 by 6 three times.

3 times 4 times 6; 4 times 6 times 5; 8 times 8 times 8.

11 times 13 = 1(4)3; 11 times 14 = 154, $(5 = 1 + 4)$, so on with the other *teens.*

$\times 6 - 4$; $7 \times 8 - 6$; $9 \times 3 - 5$; $11 \times 18 - 8$.

	Multiplicand.		Multiplier.						
1.	180566	×	2	228806	×	2	200504	×	2
4.	207099	×	3	166868	×	3	247076	×	3
7.	281649	×	4	306083	×	4	278026	×	4
10.	256854	×	5	328522	×	5	256284	×	5
13.	240756	×	6	219676	×	6	252018	×	6
16.	328603	×	7	348787	×	7	302876	×	7
19.	220426	×	8	282474	×	8	288646	×	8
22.	344881	×	9	268467	×	9	268605	×	9
25.	368641	×	11	284962	×	11	302662	×	11
28.	391662	×	12	357660	×	12	286714	×	12
31.	349087	×	14	278204	×	15	260887	×	16
34.	252240	×	18	262097	×	21	279842	×	24
37.	322564	×	27	382406	×	30	246862	×	35
40.	276466	×	36	298957	×	40	386355	×	42
43.	352847	×	44	364437	×	45	295225	×	48
46.	295459	×	22	150505	×	25	282745	×	28
49.	378254	×	32	362164	×	33	342821	×	21
52.	328362	×	24	306255	×	20	252568	×	32
55.	379248	×	18	368465	×	30	328228	×	35
58.	414866	×	21	372696	×	50	422683	×	36
61.	238683	×	31	2823272	×	32	2835087	×	29
64.	18049703	×	41	21138769	×	43	146406	×	38
67.	87908	×	51	121317	×	52	191835	×	49
70.	70359	×	61	369495	×	63	349025	×	58
73.	195264	×	72	215306	×	72	443963	×	69
76.	23456	×	211	14680	×	198	87045	×	311
79.	25063	×	289	5738	×	409	45609	×	398
82.	17890	×	511	6394	×	532	50683	×	489
85.	4579	×	617	87640	×	579	70809	×	904
88.	10800	×	7800	80070	×	5060	54000	×	8050

For Answers, see Division, page 18.

Multiply **A** and **B** by each of the numbers 5, 6, 7, 8, and add the products together:—

	A.	B.	Answers.
1.	2436	5432	204568
2.	3456	2751	161382
3.	4375	32567	960492
4.	6087	47008	1380470
5.	8435	56800	1696110
6.	34567	9874	1155466
7.	47380	6753	1407458
8.	59426	4862	1655488
9.	430806	47812	12444068
10.	743295	53654	20720674
11.	347008	98989	11595922
12.	63425	345678	10636678
13.	71384	456789	13732498
14.	85763	890756	25389494

Find the difference between the square of **A** and the cube of **B**.

1.	990	99	9801
2.	999	101	32300
3.	6860	361	13719
4.	1290	105	506475
5.	4780	296	4085936
6.	3010	193	1871043
7.	1860	167	1197863
8.	1090	104	63236
9.	1270	127	435483
10.	4460	218	9531368
11.	1540	186	4063256
12.	998	100	3996
13.	27300	907	852643
14.	98700	2130	78093000

What is the half of 4, 8, 10; the third of 9, 12, 21?

Divide 12 apples equally among 3 boys; 20 among 4.

If I have 24, to how many could I give 4? To how many 6?

6 is one of the factors of 12, 24, 36, 60; what is the other?

What numbers will exactly divide 18, 24, 30, 36, 40?

What are the factors of 42, 63, 72, 81?

5 is a factor of what composite numbers?

Give a dozen numbers made up of fives with one added (6, 11, &c.); also of sixes with one added.

Give a dozen made up of fives with 2 added.

What number is 6 times the half of 4? 7 times the third of 6? 8 times the fifth of 10? 4 times the third of 15? 5 times the fourth of 20? 3 times the eighth of 32? 4 times the fifth of 30? 6 times the ninth of 36?

Add the third of 30 to the half of 24. Take the half of 12 from the third of 36; and the fourth of 20 from the fifth of 40.

What is the average of 3, 6, and 9? of 3, 4, 6, and 7?

Find two-thirds of 12; three-fourths of 20; four-fifths of 60.

$\frac{8}{4} \times 3$; $\frac{28}{7} \times 5$; $\frac{15}{3} \times 2$; $\frac{16}{4} \times 3$; $\frac{15}{5} \times 6$. To be read thus: Divide 8 by 4, and multiply the quotient by 3; or, what number is three-fourths of 8, &c.

5 times 8 are how many times 10, 5, 4, 2, 1?

6 times 8 are how many times 12, 6, 4, 3, 2?

7 times 6 are how many times 7, 14, 3, 6?

10 times 8 are how many times 10, 5, 20, 16, 4, 2?

How many times 2 are the third of 12, 18, 24, 30?

How many times 3 are the fourth of 12, 24, 36, 48?

Divide each of the following numbers by 2, 3, 4, 5, 6, 10:—

12, 13, 14, 15, 16, 17, 18, 20, 21, 22.
15, 16, 18, 19, 21, 22, 23, 24, 28, 30.
16, 20, 25, 27, 34, 36, 40, 39, 43, 48.
11, 15, 17, 20, 25, 24, 30, 29, 41, 58.

(How many times 2 are there in 12, 13, &c.; or, 12 are how many times 2, 3, &c.)

	Dividend.		Divisor.						
1.	361132	÷	2	457612	÷	2	401008	÷	2
4.	621297	÷	3	500604	÷	3	741228	÷	3
7.	1126596	÷	4	1224332	÷	4	1112104	÷	4
10.	1284270	÷	5	1642610	÷	5	1281420	÷	5
13.	1444536	÷	6	1318056	÷	6	1512108	÷	6
16.	2300221	÷	7	2441509	÷	7	2120132	÷	7
19.	1763408	÷	8	2259792	÷	8	2309168	÷	8
22.	3103929	÷	9	2416203	÷	9	2417445	÷	9
25.	4055062	÷	11	3134582	÷	11	3329282	÷	11
28.	4699944	÷	12	4291920	÷	12	3440568	÷	12
31.	4887218	÷	14	4173060	÷	15	4174192	÷	16
34.	4540320	÷	18	5504037	÷	21	6716208	÷	24
37.	8709228	÷	27	11472180	÷	30	8640170	÷	35
40.	9952776	÷	36	11958280	÷	40	16226910	÷	42
43.	15525268	÷	44	10399665	÷	45	14170800	÷	48
46.	6500098	÷	22	3762625	÷	25	7916860	÷	28
49.	11904128	÷	32	11951412	÷	33	7199241	÷	21
52.	7880688	÷	24	6125100	÷	20	8082176	÷	32
55.	6826464	÷	18	11053950	÷	30	11487980	÷	35
58.	8712186	÷	21	18634800	÷	50	15216588	÷	36
61.	7399173	÷	31	90344704	÷	32	82217523	÷	29
64.	740037823	÷	41	908967067	÷	43	5563428	÷	38
67.	4483308	÷	51	6308484	÷	52	9399915	÷	49
70.	4291899	÷	61	23278185	÷	63	20243450	÷	58
73.	14059008	÷	72	15502032	÷	72	30633447	÷	69
76.	4949216	÷	211	2906640	÷	198	27070995	÷	311
79.	7243207	÷	289	2346842	÷	409	18152382	÷	398
82.	9141790	÷	511	3401618	÷	532	24783987	÷	489
85.	2825243	÷	617	50743560	÷	579	64011336	÷	904
88.	84240000	÷	7800	405154200	÷	5060	434700000	÷	8050

For Answers, see Multiplication, page 15.

From the continued quotient of **A** divided by 2, 4, 6, 8, take the quotient of **B** divided by 3, 5, 7, 9 :—

	A	B	Answer.
1.	76800	75600	120
2.	134400	34020	314
3.	82560	85050	125
4.	44160	77490	23
5.	215040	76545	479
6.	473856	795690	392
7.	1483008	3555090	100
8.	88320	184275	35
9.	165120	89775	335
10.	120960	76545	234
11.	274560	661500	15
12.	466176	296730	900
13.	306048	408240	365
14.	194688	340200	147
15.	300672	513135	240

Take the square of **A** from the square **B**, and divide the remainder by the *sum* (or by the *difference*) of **A** and **B** :—

A	B	A	B	A	B
365	473	2345	2468	12345	14000
972	1245	3104	3804	23456	28000
246	360	5730	6000	34567	36040
573	645	8642	8864	45678	48000
464	570	3500	4320	56789	60000
730	840	1234	1500	67890	68080
457	536	6431	7321	78900	82315
324	472	2456	2560	89000	91320
972	1000	4680	5800	90000	98642
645	840	8632	8971	12000	18000
289	365	9000	12000	20040	20400
545	842	7531	10000	40808	48080

1. What is the difference between thrice six and twenty and thrice twenty-six?
2. Add nineteen dozen to nineteen score.
3. What is the difference between six dozen dozen and half-a-dozen dozen?
4. How many times can I subtract 55 from 1000?
5. Divide the cube of 234 by the square of 234.
6. What number taken from the cube of 12 will leave ten times one hundred?
7. What number will divide both 33 and 143 without remainder?
8. What is the nearest number to 49 that can be divided by 9 without remainder?
9. How many men in 84 battalions of 500 men each?
10. How many men in 12 regiments, each containing 10 companies of 95 men each?
11. From a flock of a thousand lambs I have sent to market half-a-score a-day for three weeks; how many are left?
12. What is that number whose fifteenth part is made up of two gross, nine score, and six dozen?
13. What number multiplied by 25 will give 1000 for the product?
14. The product of two numbers is 1728, and one of them is 12; find the other.
15. The sum of two numbers is 365, and one of them is 52; find their product.
16. The difference of two numbers is 132, and the greater is 144; find their product.
17. How many Sundays are there in the year 1860, which begins on Sunday? How many Mondays and Wednesdays are in it?
18. Divide 100 oranges between two boys, so that one may have a dozen more than the other.

19. In how many hours will a cistern of 252 gallons be filled (or emptied), at the rate of 28 gallons an hour?

20. If 10,000 be the dividend, 181 the quotient, and 45 the remainder, what is the divisor?

21. In dividing a certain number by 24 there is a remainder of 8; what requires to be added to or taken from the dividend, so as to contain the divisor exactly?

22. The Bible contains 31,172 verses; by reading 86 each day how many days will it take to read through it?

23. The circumference of the earth is 360 degrees, and it revolves on its axis in 24 hours; how many degrees are equal to one hour?

24. Three Boys A, B, and C, have together 45 oranges, B and C together 30, and A and C together 40; how many had each?

25. Three boys have a certain number of oranges, A and B together 20, B and C together 30, and A and C together 40; how many had each?

26. The circumference of the earth is 24,900 miles; how many hours would it take to go round it at the rate of 60 miles an hour?

27. The population of a parish is 8052; and one out of 33 dies annually; how many die in a year?

28. John's age is one third of his father's, and his father's is one half of his grandfather's, and he was fourscore 10 years ago; what is John's age?

29. A brickmaker can make 2,000 bricks in a day; how many weeks will it take 10 men to make one-and-a-half million.

30. $\frac{273 + 87}{16 - 4}$; $\frac{56 + 37 - 9}{3 \times 4}$; $\frac{323}{17} \times 3 - 14 \times 4$.

31. $\frac{1469}{13} \times 2 + 43 - 158$; $\frac{842 + 418}{98 - 77}$; $\frac{558 + 434}{558 - 434}$.

32. $\frac{462 + 320}{2} \quad \frac{462 - 320}{2}$; $\frac{240 \times 180 \times 72}{720 \times 96 \times 36}$.

How many farthings in 2, 3, 5, 6, 8, 10 pence?

How many pence in 8, 12, 16, 24, 14, 21 farthings?

How many half-pence in 3, 4, 5, 7, 11, 12 pence?

How many pence in 4, 6, 8, 10, 7, 9, 11 half-pence?

How many pence in 2, 3, 4, 7, 5, 9 shillings?

How many shillings in 12, 24, 36, 18, 27, 64 pence?

How many shillings in 1, 2, 3, 4, 5, 6 pounds?

How many pounds in 20, 40, 100, 23, 30, 45 shillings?

How many crowns in 1, 2, 3, 5, 8, 10 pounds?

How many pounds in 4, 12, 20, 9, 17, 26 crowns?

How many half-crowns in 1, 2, 4, 5, 7, 9 pounds?

How many pounds in 8, 16, 24, 9, 17, 26 half-crowns?

How many florins in 1, 2, 3, pounds? in 2, 4, 6 crowns?

How many fourpences (and threepences) in 1, 2, 4, 5, 6 shillings?

How many farthings in 2½d., 3¼d., 4¾d., 9½d., 8¾d., 11¾d.?

How many pence in 1s. 3d., 2s. 6d., 3s. 2d., 5s. 9d., 6s. 3d., 8s. 4d.?

How many shillings in £1 7s., £2 3s., £3 15s., £5 5s.?

How many ounces in 1, 1½. 2, 2¼, 3, 4 lbs. of tea?

How many qrs. of cloth in 3, 7, 8, 9 yards?

How many inches in 3, 4, 5, 2½, 3¼, 4¾ feet?

How many feet in 3, 5, 6, 7, 1½, 2½ yards?

How many yards in 12, 18, 21, 24, 30 feet?

How many yards in 1, ½, ¼, ⅛, 2, 2½ miles?

How many hours in 1, 2, 3, 4, 5 days?

How many hours in 60, 120, 180, 240 minutes?

How many pecks of corn in 2, 4, 6, 8, 12 bushels?

How many acres in 4, 8, 10, 12, 17 roods?

How many inches round 1, 2, 3 feet square?

How many sq. yards of cloth will cover one cubic yard?

How many weeks in 4 (leap) years?

For what purposes is avoirdupois weight used? &c.

How do you reduce *yds.*, *sq. yds.*, *cub. yds.* to inches?

How may leap year be known?

Name the calendar months and number of days in each.

If each side of a square be one yard, what is the figure called?

How are numbers of one denom. changed into another denom.?

How are nos. reduced from a lower to a higher denomination?

How many half-sovereigns, crowns, half-crowns, florins, *shillings*, sixpences, fourpences, threepences, *pence*, half-pence, *farthings* in a pound?

Reduce

1. £102 to *shillings* ....2040 shillings to £.
2. £346 18s. to *shillings* ....6938 shillings to £.
3. £841 13s. to *shillings* ....16833 shillings to £.
4. £8 to *pence* ....1920 pence to £.
5. £23 to *pence* ....5520 pence to £.
6. £63 0s. 9d. to *pence* ....15129 pence to £.
7. £756 13s. 4d. to *pence* ....181600 pence to £.
8. £12 to *farthings* ....11520 farthings to £.
9. £5 5s. to *farthings* ....5040 farthings to £.
10. £58 13s. to *farthings* ....56304 farthings to £.
11. 17 5s. 3¼d. to *farthings* ....16573 farthings to £.
12. £50 8s. 6½d. to *farthings* ....48410 farthings to £.
13. £351 13s. 0½d. to *farthings* ......337586 farthings to £.
14. £397 16s. 4¾d. to *farthings* ......381907 farthings to £.
15. £25 14s. 1½d. to *halfpence* ....12339 halfpence to £.
16. £42 5s. 3½d. to *halfpence* ....20287 halfpence to £.
17. £50 to *crowns* ....200 crowns to £.
18. £720 15s. to *crowns* ....2883 crowns to £.
19. £84 17s. 6d. to *half-crowns* ......679 half-crowns to £.
20. £40 12s. 6d. to *half-crowns* ......325 half-crowns to £.
21. £108 11s. 6d. to *sixpences* ......4343 sixpences to £.
22. £10 12s. 8d. to *fourpences* ......6038 fourpences to £.
23. £34 11s. 9d. to *threepences*.......2767 threepences to £.
24. 40 guineas to £ ....42 £ to *guineas.*
25. 800 guineas to £ ....840 £ to *guineas.*
26. 700 guineas to *crowns*............2940 crowns to *guineas.*
27. 18 guineas to *twopences* ....2355 twopences to *guins.*
28. 12 guineas 17s. 4s. to *twopences*..1616 twopences to *guins.*
29. 22 half-guineas to *half-crowns*....84 hf.-crs. to *hf.-guineas.*
30. 400 half-guineas to *sixpences,*.....8400 sixps. to *hf.-guineas.*
31. 1 lb. (Troy) to *grains,*...........5760 grains to *lbs.*
32. 9 oz. 17 dwts. 22 gr. to *gr.,* ......4750 grains to *oz.*

33. 1 cwt. to *oz*, ... 1792 oz. to *cwt.*
34. 15 tons to *lb.*, ... 33600 lb. to *tons.*
35. 5 cwt. 2 qr. 15 lb. to *lb.*, ... 631 lb. to *cwt.*
36. 9 cwt. 5 lb. to *oz.*, ... 16208 oz. to *cwt.*
37. 32 cwt. 3 lb. 15 dr. to *drs.*, ... 918287 drs. to *cwt.*
38. 37 yards to *nails*, ... 592 nails to *yards.*
39. 15 yards 3 qr. 1 nail, to *inches*, .. 569½ in. to *yards.*
40. 1 mile to *inches*, ... 63360 inches to *miles.*
41. 23 miles 7 furlongs, to *feet*, ... 126060 feet to *miles.*
42. 5 miles 6 fur. 3 yds. to *inches*, ... 364428 inches to *miles.*
43. 15 acres to *poles*, ... 2400 poles to *acres.*
44. 1 acre to *inches*, ... 6272640 inches to *acres.*
45. 77 acre 1 ro. 14 p. to *poles*, ... 12374 poles to *acres.*
46. 144 acres 3 r. 24 p. to *poles* ...... 23184 poles to *acres.*
47. 23 cubic yards 1000 in. to *inches*, .. 1074088 cubic in. to *yds.*
48. 63 gallons to *pints*, ... 504 pints to *gallons.*
49. 13 gallons 3 quarts to *gills*, ... 440 gills to *gallons.*
50. 47 quarters 6 bushels to *pecks* .... 1528 pecks to *quarters.*
51. 20 (common) years to *hours*, ... 175200 hours to *years.*
52. From June 21 (longest day), to December 21 (shortest day), how many days?
53. From February 2 (Candlemas), to May 15 (Whitsunday), how many days?
54. From August 1 (Lammas), to November 11, (Martinmas), how many days?
55. From May 15 to August 1, how many days?
56. From August 26, 1859, to May 24, 1860, how many days?
57. From June 18, 1815, to Christmas, 1860, how many years and days?
58. From the birth of Christ to Christmas 1860, how many days?
59. From the vernal (March 21), to the autumnal equinox (September 21), how many days?

No.	Value of Farth's.	Value of Pence.		Value of Shillings		No.	Value of Farth's.	Value of Pence.		Value of Shillings.	
	D.	S.	D.	£	S.		D.	S.	D.	£	S.
12	3	1	0	0	12	80	20	6	8	4	0
20	5	1	8	1	0	90	22½	7	6	4	10
24	6	2	0	1	4	100	25	8	4	5	0
30	7½	2	6	1	10	110	27½	9	2	5	10
36	9	3	0	1	16	120	30	10	0	6	0
40	10	3	4	2	0	200	50	16	8	10	0
48	12	4	0	2	8	240	60	20	0	12	0
50	12½	4	2	2	10	300	75	25	0	15	0
60	15	5	0	3	0	480	120	40	0	24	0
70	17½	5	10	3	10	960	240	80	0	48	0

3 + 2; 3 + 3; 3 + 2 + 1; 3 + 3 + 2 farthings.

6 + 7; 7 + 8; 8 + 9; 9 + 10; 10 + 11 pence.

10 + 11; 9 + 11; 11 + 12; 12 + 18; 13 + 17 shillings.

19 + 13; 18 + 17; 13 + 16; 19 + 18; 14 + 13 shillings.

1s.3d + 1s.6d.; 1s.4d. + 1s.7d.; 2s.3d + 3s.5d.; 6s.8d. + 3s.4d.

1s. 9d. + 1s. 3d; 4s. 7d. + 5s. 6d; 5s. 8d. + 7s. 10d.

2¼ + 3¼; 5½ + 6½; 7¾ + 2¼; 8½ + 9¾.

£3 6s. + £5 10s.; £7 8s. + £11 12s.; £5 15s. + £4 9s.

4½ + 5½ + 6½; 7¼ + 8½ + 9¾; 6¾ + 10½ + 8¾.

2s. 6d. + 3s. 6d. + 4s. 6d; 1s. 2d. + 2s. 4d. + 4s. 8d.

25f. = 6¼d.; 25d. = 2s. 1d; 25s. = £1 5s. 26f. = 6½d.; 26d. = 2s. 2d.; and so on.

Three books cost 8d., 2s. 4d., 3s. 9d.; what is the total cost?

Three hats cost 9s. 3d., 10s. 6d., 11s. 6d.; what is the total cost?

Paid 4½d. for tea, 2¾d for coffee, and 1s. 3d. for sugar; how much in all?

I have in one pocket half-a-crown and a sixpence, in another 7 halfpence, and in my purse 3 half-sovereigns; how much altogether?

Add together 3 half-crowns, 3 sixpences, 3 threepenny pieces, and 3 halfpence.

The total number of pence in one of each of the silver coins?

The pence in 3 sixpences, 3 fourpences, and 3 half-crowns?

1.

£	s.	d.
16	8	3
53	8	7
11	7	8
54	5	7¼
38	10	6¾
0	18	10¾

2.

£	s.	d.
89	2	6¾
16	19	5¼
75	0	4½
123	10	2¾
463	15	5¼
278	6	5½

3.

£	s.	d.
9	19	11½
7	8	11½
17	14	2¾
88	7	6
89	18	9½
67	8	6½

4.

483	15	7½
441	10	0¾
835	8	1½
906	5	9¾
976	19	0¼
999	9	6½

5.

19	4	2¾
26	14	5
9	9	9¼
14	5	6½
32	4	2¼
120	12	8

6.

46	3	9½
17	8	4
1	17	5¾
45	10	8
8	3	5¾
479	19	7

7.

72	12	6½
9	4	8
17	3	5¼
46	19	3
5	10	2½
135	7	11

8.

34	17	3¼
47	11	8¾
32	14	11¼
19	18	4½
37	2	5
93	10	8¾

9.

179	12	6½
35	14	8¾
476	3	9
784	12	5½
83	17	11
359	4	6¼

10.

91	4	2
17	8	5¼
36	11	8
5	3	4½
8	17	10½
249	9	2

11.

73	4	5¾
408	13	7
94	12	8½
365	7	4
46	15	9¾
500	10	3

12.

63	4	11
8	19	4¾
19	17	8
308	8	7¼
42	3	9
580	18	5¼

For the Answers, see page 31, column B.

13.

£	S.	D.
86	17	8¼
19	4	7
34	14	5¾
342	8	8
586	7	11
253	19	4½

14.

£	S.	D.
47	14	5¾
19	3	8
32	17	5¼
17	14	8
36	12	7½
43	19	11

15.

£	S.	D.
37	19	11
9	8	7½
82	7	5½
5	0	6
36	11	11¼
47	7	6¾

16.

345	4	8¾
178	12	4½
39	14	7
83	9	5¼
324	12	8
548	18	9¾

17.

8	6	9½
17	18	4
12	3	5¼
93	14	7
68	17	4½
346	12	7

18.

9	3	4
0	17	11½
0	12	8¼
12	3	5
5	8	6½
9	7	2¾

19.

17	3	5
38	17	9½
9	12	11
36	14	5¼
12	7	4
5	3	11

20.

83	4	8½
78	18	5¼
32	12	2½
63	17	11¾
78	4	7¼
26	2	4½

21.

3	4	2¼
5	12	3
7	3	4¼
0	17	2
1	19	11½
10	10	0

22.

304	17	11¾
500	14	9½
846	12	8¾
345	8	3¼
784	4	5¼
999	19	11¾

23.

462	12	7½
346	14	11
782	4	5¼
864	17	8
387	12	5¾
999	19	11¾

24.

999	19	11½
784	12	6½
347	5	7¼
864	17	4
936	4	8¾
288	15	8¼

1.

tons.	cwt.	qr.
8	12	2
17	0	0
10	19	3
5	3	1

2.

cwt.	qr.	lb.
12	1	13
9	3	4
80	2	27
3	0	7

3.

lb.	oz.	dr.
8	2	3
5	9	11
27	15	15
6	7	2

4.

m.	fur.	po.
3	5	27
8	2	3
9	7	39
5	2	1

5.

m.	yd.	ft.
5	586	2
7	293	1
3	880	0
16	0	0

6.

yd.	ft.	in.
9	2	8
5	1	4
12	0	3
8	1	6

7.

yd.	qr.	nl.
7	2	1
5	3	3
8	1	2
5	3	1

8.

qr.	nl.	in.
3	1	2
0	3	3
1	2	1
2	0	3

9.

ac.	ro.	po.
17	2	12
99	3	39
46	2	17
5	3	2

10.

q. yd.	ft.	in.
30	2	36
17	4	72
12	6	108
121	0	0

11.

c. yd.	ft.	in.
4	26	1727
5	9	144
19	3	12
10	6	61

12.

qr.	bu.	pk.
9	7	3
2	4	1
5	3	2
8	5	3

13.

gal.	qt.	pt.
27	3	1
9	2	0
6	2	1
19	0	0

14.

da.	ho.	m.
79	23	59
5	8	7
16	4	15
3	5	1

15.

lb.	oz.	dwt.
17	11	19
4	2	1
16	3	4
12	1	5

For Answers, see page 51.

Take 1½d., 4½d., 3¼d., 2¾d., 5¼d. from a sixpence.

Take 5½d., 6½d., 1½d., 8¼d., 3¾d., 10¼d. from 1s.

Take 1s. 3½d., 1s. 7¼d., 1s. 8¾d., 4½d., 9¾d. from 2s.

Take 2s. 3½d., 1s. 9½d., 1s. 8¼d., 1s. 4¾d., 8½d. from 2s 6d.

Take 4s. 6½d., 3s. 5¾d., 2s. 6¼d., 1s. 7½d., 9½d. from 5s.

Take 9s. 1½d., 8s. 8¾d., 7s. 4¼d., 5s. 6½d., 11¾d. from 10s.

Take 15s. 6d., 13s. 4d., 12s. 6d., 6s. 8d., 3s. 7½d. from 20s.

Take each of the above sums severally from a sovereign.

Take each of the sums in the two first lines from 1s. 6d., 2s., and 2s. 6d.

Take each of the following sums from five pounds :—
£4 5s. 6d., £1 3s. 4d., £2 6s. 7½d., 9s 6½d.

Subtract by farthings from 1s. (thus—¼d., 11¾d.; ½, 11½d.; ¾d., 11¼d., etc.)

Subtract by each of the lower coins from a sovereign.

If I pay 3½d. for tea, and 6¼d. for sugar, what change shall I have out of a shilling?

I have to pay 5d., 6d., and 6½d., out of a florin; what is the change?

I have half-a-crown to pay for three articles, which cost 6½d., 7½d., and 8½d.; how much will be left?

I present a five pound note in payment of an account of £2 12s. 6d.; how much should I get back?

I had in one pocket 8½d., and in another 5½d.—I pay out 6d; how much was left?

What change shall I have out of a sovereign, after paying 12s. 6d. for a hat, and 3s. 4d. for gloves?

Take half-a-crown, a shilling, and fourpence, from a sovereign.

John has £50 a-year, and James £48 15s. 6d.; how much more has John than James?

A cow and calf were worth £20—the cow alone was worth 15 guineas; how much was the calf worth?

1.

£	s.	d.
31	3	7
14	15	4

2.

£	s.	d.
91	4	11
37	16	4

3.

£	s.	d.
30	12	3
19	4	7

4.

72	4	3½
17	18	8¼

5.

58	0	2¼
19	9	7½

6.

90	14	6½
89	15	7¾

7.

100	0	0
10	17	5¼

8.

102	0	3
85	0	9¾

9.

112	5	3
37	4	10½

10.

321	4	8½
197	14	5¾

11.

560	3	2
96	7	8¾

12.

650	12	0
372	5	6½

13.

10	0	0
0	0	0½

14.

17	8	6½
9	19	7

15.

21	4	8¾
3	10	6

16.

108	14	2½
20	6	8½

17.

120	17	4
30	18	6½

18.

121	3	8¾
53	15	2¼

19.

562	12	5
78	16	9½

20.

520	3	0¼
78	12	11½

21.

908	0	6¼
72	12	4¾

22.

1002	3	4¼
95	17	6½

23.

1050	19	0
73	19	11¾

24.

1005	14	6
6	4	8½

The Answers to the above form the first four Questions in Addition, page 26.

Subtract A from B till the remainder is less than A :—

	B			A			REMAINDERS.		
	£	S.	D.	£	S.	D.	£	S.	D.
1.	174	19	6¾	57	12	4½	2	2	5¼
2.	1046	14	6¼	238	7	6¼	93	4	5¼
3.	280	17	11¾	54	17	3¼	6	11	7½
4.	4643	8	5¼	927	12	4½	5	6	6¾
5.	222	10	9¾	49	13	7¾	23	16	2¾
6.	599	3	3¾	199	9	9¾	0	13	10½
7.	286	18	0¼	87	19	4	23	0	0¼
8.	265	15	5½	58	11	10	30	3	7½
9.	1919	5	11	380	12	5¼	16	3	8¾
10.	409	14	8¼	78	6	5¾	18	2	3½
11.	1489	4	2	370	14	7¼	6	5	9
12.	1023	12	9¼	329	12	6½	34	15	1¾
13.	1323	12	8½	387	17	4½	150	0	7
14.	198	2	9½	49	3	5¾	1	8	10½
15.	218	16	0	39	7	4¼	21	19	2¾
16.	1520	12	7¼	297	3	5¾	34	15	2½
17.	547	13	1¼	129	17	9	28	2	1¼
18.	37	13	2	12	9	11¼	0	3	4¼
19.	119	19	9¾	39	19	10	0	0	3¾
20.	363	0	3¾	78	12	5¼	48	10	6¾
21.	29	6	11¼	4	17	10¼	4	17	8
22.	3781	18	2½	756	6	2¾	0	7	0¾
23.	3844	2	1¼	948	17	11½	48	10	3¼
24.	4221	15	10¼	1406	8	7	2	10	1¼
25.	81	6	2¾	8	3	2¼	7	17	6½
26.	28	5	9¾	2	16	7	2	16	6¾
27.	90	13	5½	10	7	6¼	7	13	2½
28.	100	0	0	9	15	6¼	2	4	9½

1.

lb.	oz.	dwt.
17	4	5
8	8	8

2.

oz.	dwt.	grs.
7	2	13
2	19	8

3.

cwt.	qr.	lb.
17	1	11
9	3	18

4.

cwt.	qr.	lb.
10	3	5
4	0	13

5.

tons.	cwt.	lbs.
144	19	2
102	12	3

6.

qr.	lb.	oz.
3	10	4
2	17	12

7.

yd.	ft.	in.
5	2	3
3	0	9

8.

m.	fur.	po.
202	7	30
69	2	35

9.

po.	yd.	ft.
32	0	1
19	5	2

10.

yd.	qr.	nl.
91	1	2
17	3	3

11.

qr.	nl.	in.
3	1	0
1	3	1

12.

ac.	ro.	po.
80	2	30
35	2	38

13.

ro.	po.	yds.
3	10	29
2	18	30

14.

sq. yds.	ft.	in.
21	3	20
17	7	130

15.

po.	yd.	ft.
36	0	1
13	30	8

16.

c.-yd.	ft.	in.
91	18	1012
14	19	1444

17.

c.-yd.	ft.	in.
18	1	42
10	17	1700

18.

gal.	qt.	pt.
63	2	0
12	3	1

19.

qr.	bu.	pk.
31	1	2
17	3	3

20.

bu.	pk.	gal.
10	3	0
1	3	1

21.

d.	h.	min.
365	5	48
91	7	27

22.

h.	min.	sec.
15	3	17
8	19	50

23.

yr.	wk.	d.
4004	0	0
1859	49	2

24.

yr.	d.	h.
5863	0	0
1859	9	4

For answers see page 51.

1. A lady went a shopping with ten sovereigns; she bought a silk dress for 7 guineas, a pair of shoes for 8s. 6d., a shawl for 2 guineas, and 4 yds. of calico at 7½d. per yd.; how much money did she bring home?
2. A horse and carriage were valued at £100; what was the value of the carriage, if that of the horse was 70 guineas?
3. What is the difference between ten sovereigns and ten crowns?
4. From eighteen thousand pounds, take fifteen thousand, fifteen hundred, and fifteen pounds.
5. Paid an account of £3 17s. 0½d. with a five pound note; what should I get back?
6. Borrowed a thousand pounds, and paid at different times—£99 19s. 11½d., £42 12s. 6d., and £17 4s. 8½d.; how much is still owing?
7. What change out of a ten pound note will remain after paying the following sums:—£1 12s. 6½d., 2 guineas, and 3 half-crowns?
8. To how many persons may £6 15s. be distributed, giving each a sovereign and half-a-crown?
9. What sum added to £36 14s. 3d. will raise it to £50?
10. From £86, take £17 3s. 11¾d. five times; how much remains?
11. Tom, Dick, and Harry have together £100, of which the first two have £76 10s., and the last two £60; how much has each?
12. Mary has in her money-box, 3 half-crowns, 4 florins, and 1s. 7d. in coppers; William has in his, 13s. 8½d.; which has most, and by how much?
13. If an article cost £2 7s. 3d., and be sold for 3 guineas, what is the profit?
14. Take a guinea and a half from ten pounds.
15. How much would be left out of a pound after paying for bread 4s. 4½d., tea 3s. 2d., coffee 2s. 1d., and sugar 2s 4½d.?

16. A man receives at his bankers, in change for a cheque, 4 twenty pound notes, 7 of ten, and 13 of five pounds, 59 sovereigns, 14 half-sovereigns, 38 crowns, 35 half-crowns, 87 shillings, and 31 sixpences; what was the amount of the cheque?

17. By how much does a road 15 miles long exceed one of 8 miles 3½ furlongs?

18. By how much does the size of a field of 246½ acres exceed one of 121 acres, 30 yds., 4½ feet?

19. A cart loaded with hay weighs 1 ton, 5 cwt., and when empty, 12½ cwt.; what is the weight of the hay?

20. A ship is 7½ leagues out at sea, another is 3 leagues, 2 miles, 6 fur.; how much farther is the one than the other?

21. From a piece of cloth measuring 30½ yds., I cut sufficient for two suits; a coat requiring 3½ yds., a vest 3 qrs., and trousers 2 yds.; how much remains?

22. From a cask containing 63 gallons, there was drawn 14 galls. 3 qts., 12 galls. 2 qts., 1 pt., and 17½ galls.; how much remains?

23. A man has to make a journey of 100 miles; he walks 23 miles the first day, 24½ the next, and 26⅜ the next; how far has he still to go?

24. Take the sum of 17 qrs. 4 bu. 3 pk., 24 qrs. 3 bu., and 34½ qrs., from 80 qrs.

25. Out of 12 cwt. 1 qr. 4 lb. of sugar, I have sold 3 cwt. 3 qr. 19 lb., and 4½ cwt.; how much remains unsold?

26. If, out of an income of £400 per annum, a gentleman spends a guinea a-day, what does he save?

27. Bought a hogshead of wine, and, by an accident, 8 galls. 3 qts. 1 pt. leaked out; what remains?

28. From a field of 10 ac. 3 ro. 10 p., I have sold two house lots, one containing 1 ac. 2 ro. 13 p., the other 2 ac. 2 ro. 5 p.; how much have I remaining?

What cost 2 oz. of tea at 3½d. each; 3 oz. at 4d. ?

4 lbs. of sugar at 5d.; 8 lbs. at 6d.; 3 lbs. at 6½d.?

2 books at 1s.6d. each; 4 books at 2s.6d.; 6 books at 3s. 4d. ?

4 lbs. of tea at 4s. 2d.; 3 lbs. at 3s. 6d.; 2 lbs. at 2s. 9d.?

2 articles at 4d., 4¼d., 5d.. 5¼d , 6d., 6¼d., 7d., 7¼d. each?

2 articles at 8d., 8½d., 9d., 9½d., 10d., 10½d., 11d., 11½d. each?

2 articles at 8¾d., 9¾d., 10¾d., 11¾d., 1s. 1¾d. each?

At the following prices, required the cost of each of the following quantities:—6d., 3d., 4d., 5d., 7d., 8d., 9d., 10d., 11d., 1s.2d., 1s.4d., 1s.6d., 1s.3d., 2s.6d., 5s.2d. price of each yard. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, number of yards, e.g.

If 1 yd. cost 6d., what will 2 yds. cost? 3, 4, &c.?

4 lbs. of sugar at 5½d. per lb.; 5½ lbs. at 4d.; 11 lbs. at 2d.?

3 yds. of ribbon at 6½d.; 4 at 3¾d.; 5 at 7¼d. ?

12 crowns; 7 half-crowns; 25 fourpenny pieces?

Multiply ¼d., ½d., ¾d. by each of the nine digits.

Required the cost of each of the following quantities at the prices stated:—3, 4, 5, 6, 7, 8, 9, 10, 11, 12, at 1¼d., 2¼d., 3¼d., 2½d., 3½d., 4½d., 3¾d., 4¾d., 5¾d. each.

If 3 lbs. of sugar cost 15d., what will 6 lbs. cost?

If 2 lbs. of coffee cost 4s. 3d., what will 6 lbs. cost?

15 yards (5 × 3) 4d., 10d., 3s. 4d., £2 4s.?

16 yards at 2¼d., 7½d. 2s. 6d., 4s., 10s., £1 10s., £2 5s.?

17 yards at 3d., 4d., 5d., 6d., 10d., 1s., 1s. 2d., 2s. 6d.?

Find the cost of a dozen articles at each of the prices mentioned above. Rule.—Call the *pence* in the price *shillings*.

For 24 articles take every *half-penny* in the price as a *shilling*.

For 20 articles take every *shilling* as a *pound*.

For 100—for every *farthing* take as many *pence* and *twice* as many *shillings*.

How much a year is 3d. a day? (If for 365 days multiply £1 10s. 5d. by the pence; if for 313 days multiply £1 6s. 1d. by the pence.)

	£	s.	d.			£	s.	d.		
1.	28	6	4	×	2	576	12	3	×	2
2.	85	5	6	×	3	342	6	5	×	3
3.	63	7	5	×	4	745	7	8	×	4
4.	74	12	3	×	5	341	17	5	×	5
5.	65	8	7	×	6	678	15	7	×	6
6.	78	4	3	×	7	345	12	5	×	7
7.	85	14	7¼	×	8	532	9	8	×	8
8.	88	12	6½	×	9	672	10	9	×	9
9.	94	9	9¾	×	10	324	5	3	×	10
10.	35	12	4¼	×	11	532	4	5	×	11
11.	47	5	7½	×	14	345	4	7	×	49
12.	35	12	4¾	×	15	108	17	4	×	72
13.	64	15	3¼	×	16	342	12	5	×	81
14.	37	13	4½	×	18	735	9	5	×	56
15.	42	12	5¼	×	20	504	13	7	×	77
16.	38	5	9½	×	21	739	4	3	×	84
17.	75	17	4¾	×	25	347	11	9	×	63
18.	37	4	5¼	×	27	542	15	5	×	55
19.	47	5	9½	×	35	382	19	11	×	45
20.	69	8	7¼	×	50	568	4	7	×	32
21.	2	3	5¼	×	200	5	11	10	×	97
22.	7	16	8¾	×	21	2	13	2½	×	313
23.	1	17	3¼	×	300	1	0	6¾	×	417
24.	10	12	4¼	×	31	0	11	9¼	×	623
25.	13	5	2¾	×	41	0	17	3¼	×	365
26.	0	19	5¾	×	500	2	16	9½	×	396
27.	3	17	9¼	×	51	2	9	6½	×	936
28.	5	1	2½	×	73	2	6	10¾	×	793
29.	3	2	6¼	×	19	1	17	11¾	×	1792
30.	2	5	3¼	×	29	0	14	10¼	×	7912

For Answers, see Division, p. 39

	Multiplicand.		Multiplier.
1.	7 cwt., 3 qrs., 17 lbs.............	×	3.
2.	13 cwt., 3 qrs., 17 lbs............	×	5.
3.	1 cwt., 3 qrs., 27 lbs.............	×	12.
4.	4 lbs., 5 oz., 16 dwt., 8 grains,....	×	7.
5.	11 oz., 19 dwt., 23 grains,.........	×	9.
6.	17 yds., 3 qrs., 3 nls.,.............	×	11.
7.	6 yds., 2 qrs., 2 nls., 2 in.........	×	4.
8.	3 miles, 5 fur., 17 po., 4 yds.,....	×	5.
9.	7 miles, 3 fur., 3 po..............	×	18.
10.	20 acres, 3 ro., 14 po..............	×	10.
11.	17 acres, 1 ro., 17 po., 10 yds.......	×	12.
12,	3 sq. yds., 8 feet, 13½ inches......	×	80.
13.	7 qrs., 5 bush., 3 pks.............	×	100.
14.	5 gals., 3 qts., 1 pt., 3 gills.......	×	8.
15.	365 days, 5 hours, 48 min., 49¾ sec.	×	4.
16.	£8 9s. 3d.........................	×	5½.
17.	£8 9s. 3d.........................	×	5⅓.
18.	£8 9s. 3d.........................	×	5¾.
19.	£29 15s. 8¾d......................	×	3 5/12.
20.	17 cwt., 3 qrs., 12 lbs.............	×	4⅗.
21.	20 miles, 7 fur., 16 po.............	×	7⅝.
22.	30 acres, 3 ro., 18 po..............	×	3⅓.
23.	17 qrs., 7 bush., 3 pks.............	×	6 3-10ths.

24. Find the continued product of £1 2s. 3¼d., multiplied by 2, 4, 6, 8, 10, 12.

25. Find the continued product of £1 2s. 3½d., multiplied by 3, 5, 7, 9, 11.

26. Multiply £6 3s. 4½d. by each of the numbers, 4, 5, 6, 7, and add the products together.

27. Multiply 4 yds., 2 qrs., 3 nls., by each of the numbers, 5, 6, 7, 8, and add the products together.

28. Multiply 17 acres, 3 ro., 12 po., 14 yds., 7 ft. by each of the numbers, 1, 2, 3, 4, 5, 6, and add the products together.

Divide a shilling among 4 persons; among 6, 2, 3, 8, 12.

Divide a florin among 4 persons; among 3, 8, 6, 12.

Divide half-a-crown among 3 persons; among 5, 4, 6, 8, 10.

Divide a crown among 3 persons; among 6, 10, 12, 20, 4.

Divide a sovereign among 3 persons; among 4, 5, 6, 8, 10, 12.

Give the aliquot parts of a pound, of a shilling, &c.

8 sheep cost £10; what is the price of one?

6 hats cost 3 guineas; what is the price of one?

4 chairs cost 17s.; what is the price of one?

7 slates cost 3s. 6d.; what is the price of one?

What is ½ of 3d., 4d., 5d., 6½d., 7d., 8½d., 9d., 1s.1d.?

Divide 1s.2d., 1s.8d., 1s.3d., 2s.4½d., 3s.6d., 4s.5d. by 2.

What is ⅓ of 1s., 2s., 3s., 4s., 5s., 6s., 8s.?

Divide 2s.6d., 7s.6d., 15s.9d., 20s., 18s.4½d. by 3.

What is ¼ of 1s., 5s., 8s., 10s., 15s., 20s., 30s.?

Divide 12s.8d., 18s., 21s., 4s.5d., 24s.6d., 31s. by 4.

What is ⅓ of £1, £7, £9, £10, £11, £14?

Divide £8, £13, £22, £4 6s., £20 9s. by 3.

What is ⅛ of £1, £9, £10, £27, £36, £45?

Divide £30, £23, £11 8s., £12 16s., £9 8 4d. by 8.

5 times the 12th of 3s.; 7 times the 9th of 1s. 6d.; 6 times the 7th of 1 guinea.

6 times the 8th of £2; 7 times the 3rd of 1s. 6d.; 6 times the 3rd of 2s. 3d.

7 times the 4th of £2; 8 times the 10th of 7s. 6d.; 4 times the 5th of 8 crowns.

If 8 oz. of tea cost 2s.8d., what cost 4 oz.?

If 9 lbs. of sugar cost 4s. 6d., what cost 3 lbs.?

Add the third of a sovereign to the half of 13s. 4d.

Take the sixth of a crown from the tenth of a pound.

3 pence are what part of a shilling, of 2s., 3s., 4s., 5s.?

A dozen articles cost 1s. 6d., 2s. 3d., 3s. 9d., 5s., 6s. 3d., 7s. 6d., 8s.9d., what is the price of one? (call every shilling a penny.)

	£	s.	d.			£	s.	d.		
1.	56	12	8	÷	2	1729	4	6	÷	2
2.	105	16	6	÷	3	1026	19	3	÷	3
3.	253	9	8	÷	4	2981	10	8	÷	4
4.	373	1	3	÷	5	1709	7	1	÷	5
5.	392	11	6	÷	6	4072	13	6	÷	6
6.	547	9	9	÷	7	2319	6	11	÷	7
7.	285	6	10	÷	8	4259	17	4	÷	8
8.	752	12	10½	÷	9	6052	16	9	÷	9
9.	944	18	1½	÷	10	3242	12	6	÷	10
10.	391	15	10¾	÷	11	5854	8	7	÷	11
11.	661	18	9	÷	14	16915	3	7	÷	49
12.	534	5	11¼	÷	15	7838	8	0	÷	72
13.	1036	4	4	÷	16	3083	11	9	÷	81
14.	678	0	9	÷	18	41186	14	4	÷	56
15.	852	8	9	÷	20	38860	5	11	÷	77
16.	704	1	7½	÷	21	62093	17	0	÷	84
17.	1896	14	10¾	÷	25	21898	0	3	÷	63
18.	1004	19	9¾	÷	27	29852	7	11	÷	55
19.	1182	4	9½	÷	35	17234	16	8	÷	45
20.	3471	10	2½	÷	50	18983	6	8	÷	32
21.	434	7	6	÷	200	542	7	10	÷	97
22.	164	11	3¾	÷	21	832	14	2½	÷	313
23.	559	1	3	÷	300	428	14	6¾	÷	417
24.	608	2	11¾	÷	31	366	13	2¾	÷	623
25.	544	10	4¾	÷	41	815	3	10¼	÷	365
26.	486	19	7	÷	500	1124	9	6	÷	396
27.	198	6	3¾	÷	51	2318	11	0	÷	936
28.	369	8	2½	÷	73	1859	8	4¾	÷	793
29.	59	6	3¾	÷	19	3402	18	8	÷	1792
30.	65	12	10¼	÷	29	5876	6	2	÷	7912

For Answers, see Multiplication, p. 36.

	Dividend.		Divisor.
1.	23 cwt., 2 qrs., 23 lbs	÷	3.
2.	69 cwt., 2 qrs., 1 lb.	÷	5.
3.	23 cwt., 3 qrs., 16 lbs	÷	12.
4.	31 lbs., 4 oz., 14 dwt., 8 grains,	÷	7.
5.	107 oz., 19 dwt., 15 grains,	÷	9.
6.	197 yds., 1 qr., 1 nl.,	÷	11.
7.	26 yds., 2 qrs., 3 nls., 1¼ in.	÷	4.
8.	18 miles, 3 fur., 8 po., 3½ yds.,	÷	5.
9.	132 miles, 7 fur., 14 po.	÷	18.
10.	208 acres, 1 ro., 20 po.	÷	10.
11.	208 acres, 1 ro., 7 po., 29¼ yds.	÷	12.
12.	319 sq. yds., 1 foot, 112 inches	÷	80.
13.	771 qrs., 7 bush.,	÷	100.
14.	47 gals., 3 qts.,	÷	8.
15.	1460 days, 23 hours, 15 min., 19 sec.	÷	4.
16.	£44 8s. 6¾d.	÷	5¼.
17.	£46 10s. 10½d.	÷	5½.
18.	£48 13s. 2¼d.	÷	5¾.
19.	£101 15s. 4¾d.	÷	$3\frac{5}{12}$.
20.	82 cwt., 0 qrs., 16 lbs.	÷	4⅗.
21.	160 miles, 0 fur., 17 po.	÷	7⅝.
22.	102 acres, 3 ro., 20 po.	÷	3⅓.
23.	113 qrs., 1 bush., 2 pks., 1 gal.	÷	$6\frac{3}{10}$.
24.	£36 14s. 11¼d.	÷	£1 2s. 3¼d.
25.	£1008 2s. 11d.	÷	0 18s. 1d.
26.	£68 6s. 10½d.	÷	2 10s. 7½d.
27.	81 cwt., 1 qr., 16 lbs.,	÷	1 c. 3 qr., 16 lb.
28.	1730 yds., 1 foot, 1 in.	÷	22 yd. 1 ft. 5 in.
29.	19 ac., 3 ro., 20 po.,	÷	1 ro., 13 po.
30.	24 days, 19 h., 21 min.	÷	4 ho., 3 min.

1. What sum of money must be divided among twelve men, so that each may receive £4 3s. 4d.?
2. Divide £18 15s. among three persons, so that one may have £3 15s. more than each of the others.
3. Divide £6 16s. 9d. between 2 persons, so that one may have twice as much as the other.
4. Divide £400 10s. among 13 men and a boy; the boy to have 10 guineas and the men equal shares.
5. A cwt. of sugar which cost £3 8s. 5d., was sold at 8d. per lb.; what was the profit?
6. A man buys 24 sheep for £34, and 30 more for £46; how will he stand by selling them at 30s. a head?
7. A milliner earns 1s. 6½d. a day; how much a year?
8. A farmer sold at a fair, 12 score of sheep at 30s. each, and bought 20 head of cattle at 15 guineas each; what money did he carry home?
9. How much silk at 6s. 8d. a yard may be bought for 20 guins.?
10. Divide £100 among 7 men and 6 women, giving to each man twice the share of a woman.
11. What cost 37 carts of coal at 4s. 4½d, per cart?
12. What cost 120 oz. of silver at 5s. 3¾d. an oz.?
13. A captain's pay is 12s. 6d. a day; what is that a year?
14. What is the eighth part of 20 crowns?
15. My house rent is £5 4s. a year; what must I lay up weekly to pay it?
16. I wish to save £150 to build a house; how long will it take at £2 10s. a month?
17. Divide £11 5s. 10d. among 3 persons, so that one may have thrice as much as either of the others.
18. A prize of 1000 guineas is to be divided among 150 sailors and their officers; what is each sailor's share, one-tenth of the whole going to the officers?
19. How many roubles at 3s. 4½d. each, are equal to 54 napoleons, at 15s. 9¾d. each?
20. If 1728 wine glasses were bought for £27 3s.; how must they be sold per doz. to gain 5 guineas by the transaction?

21. How many coins, each worth 6s. 8d., are there in £40 13/4?

22. What is the total cost of a million of postage stamps?

23. How much will a person who has £250 a-year have to pay of income-tax, at 6d. per pound?

24. Find a quarter's rent of 500 acres of land, which is let for £1 15s. 6d. per acre, per annum.

25. What will £2 10s. a week amount to between the 7th Mar. and 4th April?

26. Find how many dollars at 4s. 2d. there are in £20.

27. A purse and money are together worth 20s., and the money is three times the value of the purse; what does the purse contain?

28. A ship and its cargo are worth £17,000, and the cargo is worth seven times as much as the ship; what is the value of the ship?

29. I have £15 in my purse, I shall give one-fourth to John, and one-half to James; how much is left for Mary?

30. A spoon cost 7s. 9d.; how many dozen can be bought for £46 10.?

31. If a horse stands me in 11¼d. per day, keeping; what will be the charge of 11 horses for a year?

32. 12 men and a boy have earned £31 2s. 6d., the boy is to receive 9 half-crowns; what is each man's share?

33. What is the total cost of a dozen gross of knives at 7½ each?

34. If a person who receives a legacy of £1000 spend £457 6s. 9d. in the first year, and half that sum in the second; how much will he have left at the beginning of the third year?

35. Sound travels at the rate of 1130 feet in a second; how far distant is a thunder cloud when the sound follows the flash after 7 seconds?

36. How many persons can receive 6/8 each, out of £5 13/4?

1. What sum will purchase 500 vols. at 2s. 3d. each; 300 at 5s.; 260 at 7s. 6d,; and 30 at a guinea.?
2. If an ounce of silk can be spun into a thread 110 yds. long, what weight of silk would supply a thread sufficient to reach the moon, the distance being 240,000 miles.
3. A horse cost 3 times as much as a pony, the pony 4 times as much as a saddle, and the price of the saddle was 15 half-crowns; what cost the horse?
4. A gentleman having £5 to pay among his labourers, gave to every boy 6d., to every woman 8d., and to every man 1s. 4d.; the number of boys, men, and women, was the same; how many were there of each?
5. Divide 100 sovereigns into an equal number of guineas, half-guineas, crowns, half-crowns, and shillings.
6. A bill of £13 7s. 8d. was paid by an equal number of sovs., half-crowns, shillings, sixpences, and four-penny pieces; find the number used.
7. How many farthings are there in 3 sovereigns, 3 half-sovs., and 3 half-crowns?
8. How many four-penny pieces are there in 75 guineas, and 5 crowns?
9. By how many pounds does 125 guin. exceed 722 hf.-crowns?
10. If the national debt is eight hundred millions, and thirty ten pound notes weigh one ounce; what would be the weight of the whole in such notes?
11. A soldier's step is 2½ feet; how many will he take in walking 2½ miles;
12. The diameter of a half-penny piece is 1⅕ inch; how many will it take to compass the globe at the equator?
13. If a wheel of 5 yds. 1 ft. 8 in. circumference, make 1584 revolutions: what space will it pass over?
14. What must the proprietor of a house, assessed at £24, pay towards a poor rate, at 2s. 7½d. in the pound?
15. How much will a mill grind in a year at 2 qrs. 3 bush. 3 pk. a day?
16. If a truck load of coal weigh 4 tons 4 cwt. 3 qrs. 17 lbs.; what weight of coal will be carried in a train consisting of 37 trucks?

17. If 1000 sovereigns weigh 21 lbs. 5 oz. 16 dwt. 6 gr.; what is the weight of one sovereign?

18. A land measurer's chain is 4 poles long, and is divided into 100 links; what is the length of one link?

19. How many boxes of raisins, each weighing 24½ lbs., can be filled out of half-a-dozen casks, containing 3 tons 17 cwt.?

20. Bell metal is composed of 3 parts of copper and 1 of tin; how much of each is in a bell weighing 26 cwt.?

21. A surveyor's wheel is 5½ yds. in circumference; how often will it turn in measuring 44 miles?

22. If a pair of trousers take 1 yd. 3 qrs. 2 nails, a vest 3 qrs., a coat 3 yds.; how much will it take for 64 suits?

23. A feu which should be 40 poles, is only 38 poles 30 yards 2 feet 36 inches; how much is it deficient?

24. Bought three kinds of salt, and of each an equal quantity; one was 14s., another 16s. and the third 19s. the barrel: and the whole price £490; how many barrels had I of each?

25. A farmer paid his labourers £7 4s.—six men received four guineas, 5 women each 7s. 6d., and the rest was paid in equal portions to 4 boys; what did each boy receive?

26. Nine rupees, six crowns, and eleven three-penny pieces, amount to £2 13s.; what is the value of a rupee?

27. Light travels 192,000 miles in a second; in what time does a ray come from the sun to the earth?

28. The circumference of the earth at the equator is 25,020 miles; at what rate per hour are the inhabitants carried by the earth's rotation?

29. Two persons, 100 miles apart, are travelling towards each other, one at the rate of 7 miles an hour, and the other 13; in what time will they meet?

30. Two persons, 24 miles apart, are travelling in the same direction, one at the rate of 4 miles an hour, and the other 7; in what time will the former be overtaken?

Find the value of 240 articles at 20s., 10s., 6s. 8d., 5s., 4s., 3s. 4d., 2s. 6d., 1s. 8d., 1s., 6d., 4d., 3d., 2d., 1½d, each, (by aliquot parts, mentally).

Find the value of 360 articles at 15s., 12s. 6d., 16s. 8d., 3s. 9d., 7s. 6d., 12s., 6s., 11s. 3d., 13s. 4d., 6s. 3d., 10s. 10d., 4s. 4d., (by aliquot parts, on black board.)

The following to be solved (1) by Compound Multiplication, (2) by Reduction, (3) by Practice, (progressive), (4) by Practice, (aliquot parts). The results to be verified by Division.

			£	s.	d.		£	s.	d.
1.	200	at	1	10	0	Ans.	300	0	0
2.	200	"	1	15	0	"	350	0	0
3.	248	"	2	12	6	"	651	0	0
4.	336	"	3	7	6	"	1134	0	0
5.	618	"	0	13	4	"	412	0	0
6.	842	"	0	5	10	"	245	11	8
7.	416	"	0	8	6	"	177	16	0
8.	643	"	0	16	4	"	525	2	4
9.	240	"	3	19	10	"	969	19	6
10.	114	"	5	16	3	"	662	12	6
11.	216	"	3	17	6	"	837	0	0
12.	324	"	4	12	10	"	1503	18	0
13.	486	"	0	7	9	"	188	6	6
14.	793	"	0	15	10	"	627	15	10
15.	864	"	0	4	6½	"	196	4	0
16.	623	"	0	13	8½	"	427	0	3½
17.	224	"	3	15	5¾	"	845	7	4
18.	318	"	2	6	2¼	"	734	7	7½
19.	112	"	5	3	10¾	"	581	16	4
20.	218	"	3	9	3¼	"	755	1	0½
21.	320½	"	4	0	6½	"	1290	13	7¼
22.	408⅓	"	6	0	9¾	"	2466	11	9¼
23.	200⅕	"	10	0	6¼	"	2007	4	3¼
24.	144½	"	12	0	0½	"	1734	6	0¼

1. Bought 8 lbs. of pepper at 1s. 8d. per lb., 12 lbs. currants at 5½d., 14 lb. raisins at 6½d., and 16 lbs. rice at 3¼d.; what is the amount of my account? Ans. £1 10s. 9d.

2. Bought 48 yds. Irish linen at 3s. 6½d., 42 yds. cambric at 2s. 3d., 28 yds. calico at 7½d., and 18 yds. muslin at 1s. 1½d.; what is the amount of my bill? Ans. £15 2s. 3d.

3. Make out a bill for the following sales:—19 lbs. Stilton cheese at 1s. 3d., 18 lbs. Dunlop cheese at 8½d., 17 lbs. Ayrshire butter at 1s. 1½d., and 10 lbs. Irish butter at 9¼d. Ans. £3 3s. 4d.

4. Make out a bill for the following:—27 lbs. beef at 9½d., 18 lbs. mutton at 7¼d., 23 lbs. veal at 7½d., 16 lbs. lamb at 9¾d., and 13 lbs. pork at 6¾d. Ans. £3 6s. 11¼d.

5. Make out an account for the following:—28 lbs. soft sugar at 6½d., 16 lbs. loaf sugar at 9¼d., 12 lbs. tea at 5s. 6¾d., 18 lbs. coffee at 3s. 4¼d., and 10 cakes chocolate at 4s. 7½d. Ans. £10 0s. 10½d.

6. Sold 98 yds. satin at 8s. 3d., 85 yds. velvet at 23s. 9½d., 73 yds. coloured silk at 7s. 6½d., and 52 yds. Brussels lace at 10s. 6d. Ans. £196 7s. 4d.

7. Sold 240 sacks potatoes at 8s. 6d., 60 stones of wool at 13s. 6d., and 80 sheep at 33s. 4d. Ans. £275 16s. 8d.

8. Sold 84 yds. broad cloth at 22s. 4d., 68 yds. doeskin at 8s. 7¼d., 26 yds. kerseymere at 15s. 3¾d., and 33 yds. Scotch tweed at 7s. 8½d. Ans. £155 13s. 11d.

9. Shipped for Australia, as per order, 500 yds. linen at 2s. 1½d., 360 yds. muslin at 3s. 11¼d., 954 yds. cambric at 2s. 7¾d., 126 gallons whisky at 13s. 6d., 160 stones cheese at 12s. 9d.; make out an invoice to accompany the goods. Ans. £437 5s. 1½d.

10. A corn factor sold for his employer 40 qrs. wheat at 63s. 6d., 29 qrs. oats at 28s. 4d., and 17 qrs. barley at 38s. 3d.; make out an account sales. Ans. £200 11s. 11d.

11. Sold 83½ yds. carpet at 3s. 4½d., 50¼ yds. sheeting at 1s. 6½d. and 240¾ yds. welsh flannel at 2s. 7½d.; make out the bill. Ans. £49 11s. 3d.

To be worked (1) *by Analysis or First Principles*; (2) *by Proportion or Rule of Three*

1. If 2 lbs of butter cost 2s. 4d., what will 10 lbs. cost?
2. If 3 stones of onions cost 3s. 9d., what will 12 stones cost?
3. If 4 lbs. of grapes cost 5s. 6d., what will 16 lbs. cost?
4. If 5 lbs. of coffee cost 9s. 2d., what will 35 lbs. cost?
5. If 6 lbs. of tea cost £1 5s., what will 18 lbs. cost?
6. If 8 lbs. of sugar cost 3s. 4d., what will 72 lbs. cost?
7. The price of 3 yards is 15s. 6d., what is the price of 13 yds.?
8. The price of 4 yards is £1 4s., what is the price of 25 yards?
9. The price of 5 yards is £1 15s., what is the price of 21 yards?
10. The price of 6 yards is £3 6s., what is the price of 20 yards?
11. The price of 7 yards is 3s. 6d,, what is the price of 23 yards?
12. The price of 8 yards is 20s., what is the price of 19 yards?
13. If 15 yards cost 3s. 6d., what will 20 cost?
14. If 24 yards cost 13. 4d., what will 30 cost?
15. If 49 yards cost 3s, 6d., what will 56 cost?
16. If 48 yards cost 18s. 6d., what will 88 cost?
17. If 27 yards cost 5s. 3d., what will 63 cost?
18. If 40 yards cost 10s. 8d., what will 90 cost?
19. If 3 lambs cost £1 5s., how many will £20 buy?
20. If 3 yards cost 13s. 6d., how many will £1 16s. buy?
21. If 3½ yds. cost £3 12s. 11d., how many will £14 11s. 8d. buy?
22. If 30 yards cost £18., how many will £3 12s. buy?
23. If £4 18s. buy 1 cwt. of pears, what quantity will 6s. 1½d. buy?
24. If 12s. 6d. buy 12½ lbs. of butter, what quantity will £1 buy?
25. When wheat sells at 25s. ⅌ 240 lbs., what is the rate ⅌ ton?
26. When oats sell at 22s. per 264 lbs., what is the rate per ton?
27. When barley sells at 25s.6d. ⅌ 360 lbs., what is the rate ⅌ ton?
28. When flour sells at 35/ per 280 lbs. what is the rate per stone?
29. When oatmeal sells at 37/6 per 280 lbs. what is that per cwt.?

30 When flour is 35s. per sack (280 lbs.) what is that per barrel (196 lbs.)?

1. If 10 lbs. of butter cost 11s. 8d. what will 2 lbs cost?
2. If 12 stones of onions cost 15s., what will 3 stones cost?
3. If 16 lbs. of grapes cost 22s., what will 4 lbs. cost?
4. If 35 lbs. of coffee cost 64s. 2d., what will 5 lbs. cost?
5. If 18 lbs. of tea cost £3 15s., what will 6 lbs. cost?
6. If 72 lbs. of sugar cost 30s., what will 8 lbs. cost?
7. If 13 yds. of cloth cost £3 7s. 2d. what will 3 yds. cost?
8. If 25 cost £7 10s. what will 4 cost?
9. If 21 cost £7 7s., what will 5 cost?
10. If 20 cost £11, what will 6 cost.
11. If 23 cost 11s. 6d., what will 7 cost?
12. If 10 cost £2 7s. 6d., what will 8 cost?
13. If 20 cost 4s. 8d., what will 15 cost?
14. If 30 cost 16s. 8d., what will 24 cost?
15. If 56 cost 4s. what will 49 cost?
16. If 88 cost 33s. 11d., what will 48 cost?
17. If 63 cost 12s. 3d., what will 27 cost?
18. If 90 cost 24s., what will 40 cost?
19. If 48 lambs cost £20, how many will £25 buy?
20. If 8 yds. of cloth cost 36s., how many will 13s. 6d. buy?
21. If 14 yds. cost £14 11s. 8d., how many will £3 12s. 11d. buy
22. If 5 yds. cost £3 12s., how many will £18 buy?
23. If 7 lb. of pears cost 6s. 1½d., what quantity will £4 18s. buy?
24. If £1 buy 20 lbs. of butter, what quantity will 12s. 6d. buy?
25. If 20 cwt. of wheat cost £11 13s. 4d., what will 240 lbs. cost?
26. If 20 cwt. of oats cost £9 6s. 8d., what will 264 lbs. cost?
27. If 20 cwt. of barley, cost £7 18s. 4d., what will 360 lbs. cost?
28. If 14 lbs. of flour cost 1s. 9d., what will 280 lbs. cost?
29. If 1 cwt. of oatmeal cost 15s., what will 280 lbs. cost?
30. If 196 lbs. of flour cost 24s. 6d., what will 280 lbs. cost?
31. If 24 yds. cost £1 8s. 6d., what will 37 cost?
32. If 8 yds. cost £3 5s. 6d., what will 28 cost?
33. If 148 yds. cost £8 15s. 9d., how many will 11s. 10½d. buy?

1 If a servant's wages be £9 for 12 months, what should he receive for 7 months? Ans. £5 5s.,

2. If a servant receive £2 10s. for 20 week's service, how long ought he to remain in his place for £6 10s.? Ans. 1 year.

3 If 7 masons build a wall in 30 days, in what time will 5 masons build it? Ans. 6 weeks.

4 If 42 masons build a house in 108 days, how many masons will build it in 63 days? Ans. 72.

5. If 4 men can mow 3 acres of oats in a day, how many acres can 17 men mow in the same time? Ans. 12¾.

6. How long will provisions last 35 persons, which 90 persons can consume in 21 days? Ans. 54 days.

7 If 3 pipes fill a cistern in 15 hours, in what time will 10 such pipes fill it? Ans. 4½ hours.

8. If a pipe fill a cistern it 36 minutes, how many such pipes will fill it in 4½ minutes? Ans. 8.

9. If 6 horses can eat a stack of hay in 6 weeks, in how many days will 7 horses eat half the stack? Ans. 18.

10. What board wages should I pay, from 10th April, 1857, to the 22nd June, 1860, at the rate of 50 guineas per annum? Ans. £168.

11. If I lend a friend £50 for 6 months, how long ought he to give me the use of £40 in return? Ans. 7½ months.

12. If a person spend as much in 4 months as he gains in 3, how much can he lay by annually out of an income of £251? Ans. £60 5s.

13. What can a person save per annum, who out of an income of £200 gives away one twelfth, pays 7d. in the pound income tax, and spends on an average, 2 guineas per week? Ans. £68 6s.

14. How much is a person's income from 7th Feb. to 3d July, at 50 guineas a-year? Ans. £21.

15 If the interest of £100, be £3 10s., what will be the interest of £320? Ans. £11 4s.

16. If 60 ten-penny loaves can be got from a qr. of wheat, how many eight-penny loaves will it yield? Ans. 75.

17. If the six-penny loaf weigh 3 lbs. 8 oz. when wheat is at 6s. a bushel, what ought it to weigh when the wheat is at 7s? Ans. 3 lbs.

18. When coffee sells at 5½d. per oz., what must be given for 2 cwt? Ans. £82 2s. 8d.

19. If 24 lbs. of raisins cost 6s. 6d, what will be the cost of 18 casks, each containing 3 qrs. 18 lbs.? Ans. £24 17s. 3d.

20. A wall containing 372 square feet is paid for at the rate of 1s. 10½d. per square yard; find the cost of the whole? Ans. £3 17s. 6d.

21. When ivory costs 30 guineas per cwt., what is the worth of a tusk weighing 84½ lbs? Ans. £23 15s. 3¾d.

22. Six dozen loaves of sugar cost £43 10s., what cost 73 loaves? Ans. £44 2s. 1d.

23. What cost 25 cwt., 3 qrs., 14 lbs., at 4s. 6¼d. for 3½ lbs? Ans. £187 3s. 3d.

24. The brazen statue of Apollo at Rhodes weighed 321 tons, 8 cwt., 2 qrs., 8 lbs., what is the value of the metal at 4 guineas per cwt.? Ans. £27000.

25. What is gained by the sale of 100 yards of cloth, that was bought at the rate of 5 yards for 35s. and sold at the rate of 7 yards for £6 13s.? Ans. £20.

26. An ounce of gold costs £3 17s. 10½d., what is the value of a gold tankard weighing 2 lbs., 5 oz., 12 dwt., 3 grains? Ans. £115 4s. 11½d.

27. A farmer, who has his farm at a corn rent, paid £180 15s. 6¾d. when wheat was 5s. 6d. per bushel, how much ought he to pay when wheat sells at 10s. 6d. per bushel? Ans. £343 0s. 5½.

28. If a dealer in liquids use instead of a gallon, a measure which is deficient by a gill, what will be the true measure of 100 of these false gallons? Ans. 96 gallons 7 pints.

29. If a staff 3 feet long cast a shadow of 3 feet 9 inches, what is the height of a steeple whose shadow at the same time is 45 yards? Ans. 108 feet.

Pages 12, 13.—(1) 53994. (2) 999000. (3) 76866. (4) 7912 (5) 1889. (6) 5864. (7) 8000. (8) 486. (9) 1000. (10) 450. (11) 6996. (12) 3448. (13) 2190. (14) 794 years. (15) 39 years. (16) 8575 years. (17) 669. (18) 473 years. (19) 546, 347, 114, 45 years. (20) 733 years. (21) 1759. (22) 558, 530, 419 years. (23) 10 miles. (24) £5. (25) 36. (26) John 36, James 9. (27) 90. (28) 74. (29) 103. (30) Monday. (31) Sunday. (32) 18, 70. (33) 10 miles. (34) 44 miles. (35) 4208. (36) 50.

Pages 20, 21.—(1) 40. (2) 608. (3) 792. (4) 18 times, rem. 10. (5) 234. (6) 728. (7) 11. (8) 45. (9) 42000. (10) 11400. (11) 820. (12) 8100. (13) 40. (14) 144. (15) 114245. (16) 1728. (17) 53, 53, 52. (18) 56, 44. (19) 9. (20) 55. (21) 16 (or 16 + 24, 48 &c. to be added), 8 (or 8 +24, &c. to be subtracted.) (22) 362 $\frac{4}{8}\frac{1}{6}$. (23) 15. (24) A. 15, B. 5, C. 25. (25) A. 15, B. 5, C. 25. (26) 415. (27) 244. (28) 15. (29) 10 w. 5 d. (30) 30, 7, 172. (31) 111, 60.

Page 24.—(52) 183. (53) 102. (54) 102. (55) 78. (56) 272. (57) 45 y. 190 d. (58) 679365. (59) 186.

Page 28.—(1) 41 tons, 15 cwt., 2 qrs. (2) 105 cwt., 3 qrs., 23 lb. (3) 48 lb., 2 oz., 15 dr. (4) 27 m., 1 fr., 30 po. (5) 32 m. (6) 35 yd., 2 ft., 9 in. (7) 27 yd., 2 qrs., 3 nl. (8) 8 qr., 2 nl. (9) 169 ac., 3 ro., 30 po. (10) 181 yds., 4 ft., 72 in. (11) 39 yds., 18 ft., 216 in. (12) 26 qrs., 5 bush., 1 pk. (13) 63 gals. (14) 104 d., 17 h.. 22 m. (15) 50 lb., 6 oz., 9 dwt.

Page 32.—(1) 8 lb., 7 oz., 17 dr. (2) 4 oz., 3 dwt., 5 gr. (3) 7 cwt., 1 qr., 21 lb. (4) 6 cwt., 2 qrs., 20 lb. (5) 42 tons, 6 cwt., 3 qrs. (6) 20 lb., 8 oz. (7) 2 yds., 1 ft., 6 in. (8) 133 m., 4 fur., 35 po. (9) 11 po., 5 yds., 2 ft. (10) 73 yds., 1 qr., 3 nl. (11) 1 qr., 1 nl., 1¼ in. (12) 44 ac., 3 ro., 82 po. (13) 31 po., 29¼ yds. (14) 3 yds., 4 ft., 34 in. (15) 16 po., 29 yds., 6½ ft. (16) 76 yds., 25 ft., 1296 in. (17) 7 yds., 10 ft., 70 in. (18) 50 gals., 2 qts., 1 pt. (19) 13 qrs., 5 bush., 3 pks. (20) 8 bush., 3 gal., 1 qt. (21) 273 d., 22 h., 21 m. (22) 6 h., 43 m., 27 s. (23) 2144 yrs., 2 w., 5 d. (24) 4003 yrs., 355 d., 20 h.

Page 33, 34—(1) none. (2) £26 10s. (3) £7 10s. (4) £1485. (5) £1 2s 11½d. (6) £840 2s. 10d. (7) £5 17s. 11½d. (8) 8. (9) £13 5s. 9d. (10) 1¼d. (11) Tom £40, Dick £36 10s., Harry £23 10s. (12) Mary 3s. 4½d. (13) 15s. 9d. (14) £8 8s. 6d. (15) 8s. (16) £300. (17) 6 m., 4 f., 20 po. (18) 125 ac., 1 ro., 38 po., 30 yds. (19) 12 cwt., 2 qrs. (20) 3 leags., 1 m., 6 f. (21) 18 yds. (22) 18 gal., 1 pt. (23) 26 m., 1 f. (24) 3 qrs., 4 bu., 1 pk. (25) 3 cwt., 3 qrs., 13 lb. (26) £16 15s. (27) 54 gals., 1 pt. (28) 6 ac., 2 ro., 32 po.

Page 37—(24) £51312. (25) £11575 5s. 3¾d. (26) £135 14s. 3d. (27) 121 yds., 3 qrs., 2 nl. (28) 374 ac., 1 ro., 22 po., 7 yds., 7½ ft.

Page 40—(24) 33. (25) 1115. (26) 27. (27) 43. (28) 77. (29) 60. (30) 147.

Page 41, 42—(1) £50. (2) £5, £5, £8 15s. (3) £2 5s. 7d. £4 11s. 2d. (4) £30 each man. (5) 6s. 3d. (6) gains £1. (7) £24 2s. 6½d. (8) £45. (9) 63 yds. (10) each man £10, each woman £5. (11) £8 1s. 10½d. (12) £31 17s. 6d. (13) £228 2s. 6d. (14) 12s. 6d. (15) 2s. (16) 5 years. (17) £2 5s. 2d.; £2 5s. 2d.; £6 15s. 6d. (18) £6 6s. (19) 253 (20) 4s. 6d. (21) 122. (22) £4166 13s. 4d. (23) £6 5s. (24) 221 17s. 6d. (25) £10. (26) 96. (27) £2125. (28) 15s. (29) £3 15s. (30) 10. (31) £192 7s. 8½d. (32) £2 10s. (33) £54. (34) £313 19s. 10½d. (35) 1½ mile (nearly). (36) 17.

Pages 43, 44—(1) £260 5s. (2) 107 tons, 2 cwt., 3 qr., 12 lbs. (3) £22 10s. (4) 40. (5) 50. (6) 11. (7) 4680. (8) 4800. (9) 41. (10) 74 tons, 8 cwt., 10⅔ lbs. (11) 5280. (12) 1,321,056,000. (13) 5 miles. (14) £3 3s. (15) 772 qrs., 5 bu., 3 pk. (16) 157 tons, 1 cwt., 1 qr., 13 lbs. (17) 5 dwt., 3¾ gr. (18) $7\frac{23}{25}$ in. (19) 352. (20) 6½; 19½. (21) 14080 times. (22) 360 yds. (23) 1 pole. (24) 200. (25) 5s. 7½d. (26) 2s. 3d. (27) 8 min., 14 sec. (28) 1042½ miles. (29) 5 hours. (30) 8 hours.

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